CLAIMS

1.   An impurity measuring method characterized by
comprising the steps of:
          arranging a sample having a fracture surface
on a table with the fracture surface facing up;
          irradiating the fracture surface with light
from a plurality of directions from above the table;
          sensing an image of the fracture surface
irradiated with the light;
          processing the sensed image into a continuous
tone color image; and
          binarizing the continuous tone color image
through comparison between a result of the continuous
tone color image processing and a threshold value.

2.   An impurity measuring method according to
claim 1, characterized in that the step of irradiating
with the light includes the step of irradiating the
fracture surface with indirect illumination.

3.   An impurity measuring method according to
claim 1, characterized in that the step of irradiating
with the light includes the step of irradiating the
fracture surface with indirect illumination of light
from a light source which is reflected by a concave
reflection surface having a substantially semicircular
section.

4.   An impurity measuring method according to

2 claim 1, characterized by further comprising the steps

3 of:

4   detecting an image region having a higher

5 luminance than the threshold value from the binarized

6 image; and

7   measuring a pixels count of the detected image

8 region.

5.   An impurity measuring method according to

2 claim 4, characterized by further comprising the steps

3 of:

4   recognizing the detected image region as an

5 impurity region when the measured pixel count is larger

6 than a predetermined pixel count; and

7   avoiding recognizing the detected image region

8 as an impurity region when the measured pixel count is

9 smaller than the predetermined pixel count.

6.   An impurity measuring method according to

2 claim 1, characterized in that

3   the step of arranging a sample includes the

4 step of arranging an aluminum sample on the table.

7.   An impurity measuring method according to

2 claim 1, characterized in that the step of sensing an

3 image includes the step of sensing an image of the

4 fracture surface by a CCD camera.

8.   An impurity measuring device characterized by

2 comprising:

3   a table on which a sample having a fracture

4   surface facing up;

5   illuminating means, arranged above the table,

6   for irradiating the fracture surface with light from a

7   plurality of directions;

8   image sensing means for sensing an image of

9   the fracture surface irradiated with the light;

10   continuous tone color image processing means

11 for processing the sensed image into a continuous tone

12 color image; and

13   binarizing means for binarizing the continuous

14 tone color image through comparison between a result of

15 the continuous tone color image processing and a

16 threshold value.

    9.   An impurity measuring device according to

2   claim 8, characterized in that said illuminating means

3   includes

4   a light source which emits light, and

5   a reflection member which reflects the light

6   from said light source.

    10.   An impurity measuring device according to

2   claim 9, characterized in that

3   said reflection member comprises a reflection

4   dome which has a substantially semicircular section and

5   a downward concave reflection surface, and

6   said light source comprises a plurality of

7   light sources which are arranged to face upward along an

8   inner edge of said concave reflection surface of said

9   reflection dome.

11.   An impurity measuring device according to

2   claim 10, characterized in that said light sources

3   comprise light-emitting diodes.

12.   An impurity measuring device according to

2   claim 10, characterized in that

3   said reflection dome has an opening in the

4   vicinity of a vertex thereof, and

5   said image sensing means is arranged above the

6   opening.

13.   An impurity measuring device according to

2   claim 8, characterized by further comprising:

3   high-luminance region detection means for

4   detecting an image region having a higher luminance than

5   the threshold value from the image binarized by said

6   binarizing means; and

7   pixel count measuring means for measuring a

8   pixel count of the image region detected by said

9   high-luminance region detection means.

14.   An impurity measuring device according to

2   claim 13, characterized by further comprising impurity

3   region recognizing means for recognizing the image

4   region detected by said high-luminance region detection

5   means as an impurity region when the pixel count

6   measured by said pixel count measuring means is larger

7   than a predetermined pixel count, and avoiding

8   recognizing the detected image region as an impurity

9   region when the measured pixel count is smaller than the

10   predetermined pixel count.

15.   An impurity measuring device according to

2   claim 8, characterized in that the sample comprises

3   aluminum.

16.   An impurity measuring device according to

2   claim 8, characterized in that said image sensing means

3   comprises a CCD camera.